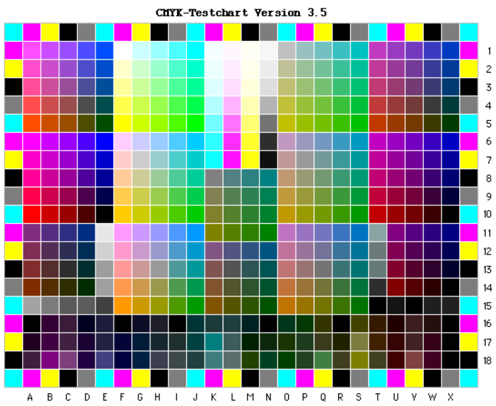
Color Management Profiling for the
HP DesignJet 10/20ps

Draft 1.1 • 4/18/02

Introduction

The HP DesignJet 10/20ps comes with standard profiles for CMYK and RGB working spaces and with profiles for HP media. However, to get the most accurate color, you may wish to make custom profiles for your DesignJet, as well as for other devices in your workflow.



Custom ICC profiles created with applications like GretagMacbeth ProfileMaker help the DesignJet 10/20/50ps to print more accurate color and to do a more effective job of emulating other devices and processes.

Devices to Profile

Devices you may want to profile include your:

- HP DesignJet on each proofing medium you use regularly
- devices or processes you want the DesignJet to match, such as analog or digital proofing, or your printing press
- scanner or digital camera, for optimum color on input
- monitor, for accurate soft proofing

What You Will Need

To make custom profiles, you will need:

1. A profiling program, such as GretagMacbeth Eye One Match or ProfileMaker Pro, MonacoPROFILE, Heidelberg ScanOpen/PrintOpen, or similar product.
2. Color targets to scan, digitally photograph, and print. These are usually included with the profiling application, but different scanner or camera targets may need to be purchased separately.
3. A color measurement instrument to read reflection prints and monitor colors. Examples include GretagMacbeth's Eye One and Spectrolino/SpectroScan, and X-Rite's DTP41 AutoScan Spectrophotometer and DTP92 Monitor Optimizer.

Profiling Procedures

The following pages show the basic steps for making printer, scanner, and monitor profiles.

Profile Editing

Making custom profiles of your HP DesignJet 10/20/50ps and the devices you want it to simulate will help you get a better color match. However, for the most accurate color, it may be necessary to edit your ICC profiles using a profile-editing application such as GretagMacbeth ProfileEditor or ColorBlind Edit.

Profile editing requires some expertise in "traditional" color—tone reproduction, gray balance, and color correction.

Basic steps to using ProfileEditor to make an HP DesignJet 10/20/50 profile more closely match a specified target are shown on page 6.

Vendors

Color Management Instruments and Software

Following is a partial list of color management systems vendors. Some vendors sell instruments, others sell software, and others sell both.

GretagMacbeth LLC
617 Little Brittain Road
New Windsor, NY 12553
800/622-2384
www.gretagmacbeth.com

Graphic Intelligence Agency

Graphic Intelligence Agency
4040 Embassy Pkwy. Ste. 370
Akron, OH 44333
330/665-9858
www.graphintel.com

Heidelberg Prepress
100 Gutenberg Dr.
Kennesaw, GA 30144
770/419-6600
www.heidelbergusa.com

Imaging Technologies Corp.
15175 Innovation Dr.
San Diego, CA 92128
619/613-1300
www.color.com

Monaco Systems, Inc.
110 Burtt Road, Suite 110
Andover, MA 01810
508/749-9944
www.monacosys.com

Praxisoft, Inc.
1400 Shepart Dr., Suite 200
Sterling, VA 20164
703/450-8001
www.praxisoft.com

X-Rite, Inc.
3100 44th Street, S.W.
Grandville, MI 49418
616/534-7663
www.x-rite.com

Making a Printer Profile

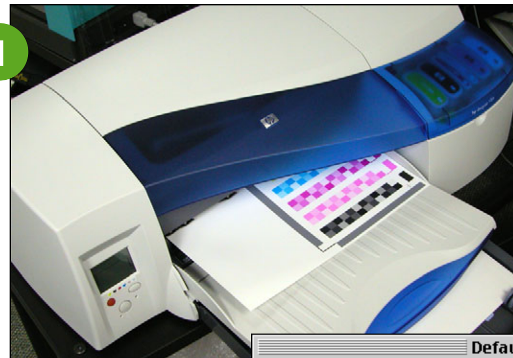
What You Will Need

1. Profiling application
2. Colorimeter or spectrophotometer
3. Printed color target

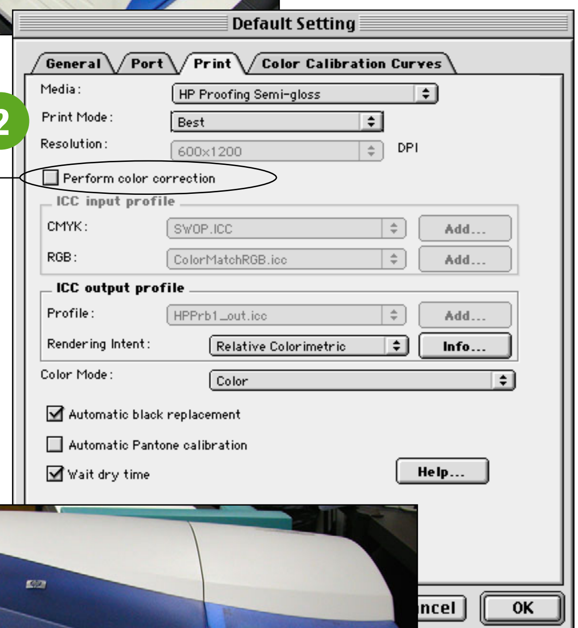
Procedure

1. Calibrate the DesignJet 10/20/50ps to the medium you want to profile using the RIP's “Automatic Color Calibration” function.
2. Turn off color management in the DesignJet RIP.
3. Print the CMYK color profiling target that comes with your profiling application. (It is usually a TIFF file.)
4. Meaure the target using the spectrophotometer connected to your profiling application.
5. Save the ICC profile in the DesignJet software RIP folder (ICC Profile>HP DesignJet 10 20).

1



2



Turn off color management in the RIP before outputting the color management target.

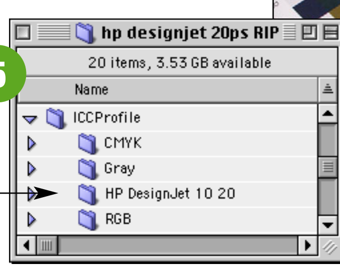
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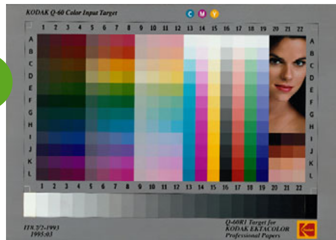


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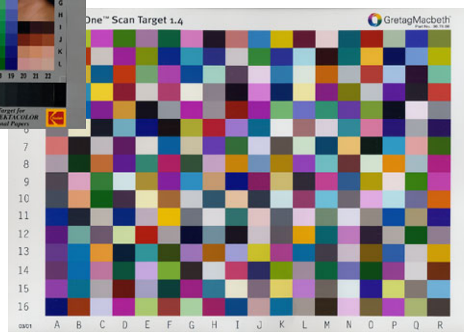


Making a Scanner Profile

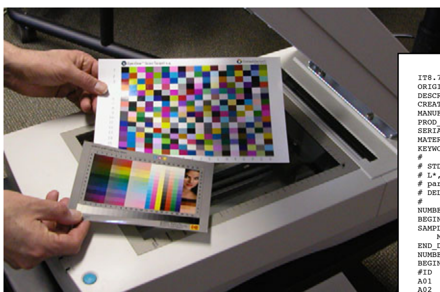
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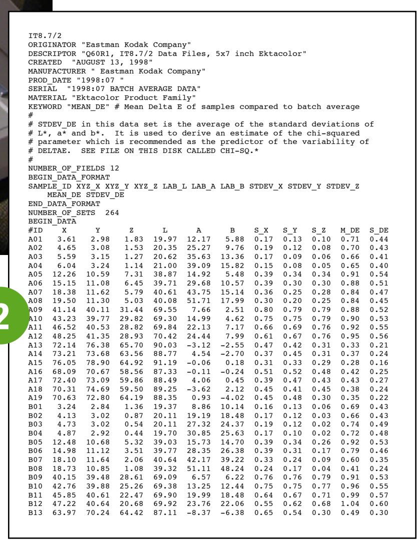
IT8.7/2 Target



GretagMacbeth i1 Target



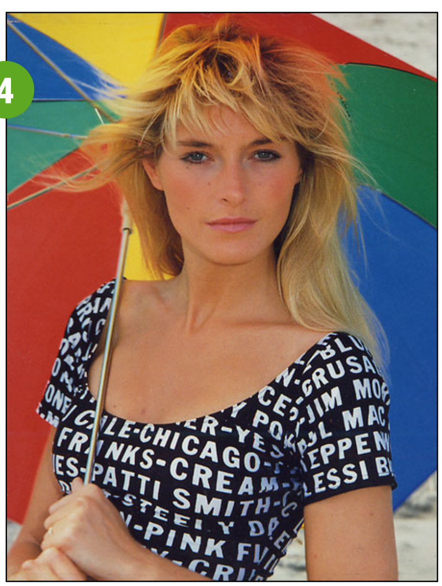
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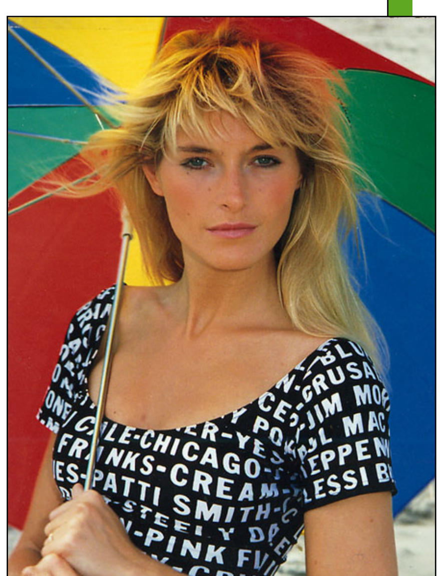
```
IT8.7/2
ORIGINATOR "Eastman Kodak Company"
DESCRIPTOR "Q60R1, IT8.7/2 Data Files, 5x7 inch Ektacolor"
CREATED  "AUGUST 13, 1998"
MANUFACTURER " Eastman Kodak Company"
PROD_DATE "1998:07 "
SERIAL  "1998:07 BATCH AVERAGE DATA"
MATERIAL "Ektacolor Product Family"
KEYWORD "MEAN_DE" # Mean Delta E of samples compared to batch average
#
# STDEV_DE in this data set is the average of the standard deviations of
# L*, a* and b*.  It is used to derive an estimate of the chi-squared
# parameter which is recommended as the predictor of the variability of
# DELTAE.  SEE FILE ON THIS DISK CALLED CHI-SQ.*
#
NUMBER_OF_FIELDS 12
BEGIN_DATA_FORMAT
SAMPLE_ID XYZ_X XYZ_Y XYZ_Z LAB_L LAB_A LAB_B STDEV_X STDEV_Y STDEV_Z
    MEAN_DE STDEV_DE
END_DATA_FORMAT
NUMBER_OF_SETS  264
BEGIN_DATA
#ID    X      Y      Z      L      A      B     S_X   S_Y   S_Z   M_DE  S_DE
A01   3.61   2.98   1.83  19.97  12.17   5.88  0.17  0.13  0.10  0.71  0.44
A02   4.65   3.08   1.53  20.35  25.27   9.76  0.19  0.12  0.08  0.70  0.43
A03   5.59   3.15   1.27  20.62  35.63  13.36  0.17  0.09  0.06  0.66  0.41
A04   6.04   3.24   1.14  21.00  39.09  15.82  0.15  0.08  0.05  0.65  0.40
A05  12.26  10.59   7.31  38.87  14.92   5.48  0.39  0.34  0.34  0.91  0.54
A06  15.15  11.08   6.45  39.71  29.68  10.57  0.39  0.30  0.30  0.88  0.51
A07  18.38  11.62   5.79  40.61  43.75  15.14  0.36  0.25  0.28  0.84  0.47
A08  19.50  11.30   5.03  40.08  51.71  17.99  0.30  0.20  0.25  0.84  0.45
A09  41.14  40.11  31.44  69.55   7.66   2.51  0.80  0.79  0.79  0.88  0.52
A10  43.23  39.77  29.82  69.30  14.99   4.62  0.75  0.75  0.79  0.90  0.53
A11  46.52  40.53  28.82  69.84  22.13   7.17  0.66  0.69  0.76  0.92  0.55
A12  48.25  41.35  28.93  70.42  24.44   7.99  0.61  0.67  0.76  0.95  0.56
A13  72.14  76.38  65.70  90.03  -3.12  -2.55  0.47  0.42  0.31  0.33  0.21
A14  73.21  73.68  63.56  88.77   4.54  -2.70  0.37  0.45  0.31  0.37  0.24
A15  76.05  78.90  64.92  91.19  -0.06   0.18  0.31  0.33  0.29  0.28  0.16
A16  68.09  70.67  58.56  87.33  -0.11  -0.24  0.51  0.52  0.48  0.42  0.25
A17  72.40  73.09  59.86  88.49   4.06   0.45  0.39  0.47  0.43  0.43  0.27
A18  70.31  74.69  59.50  89.25  -3.62   2.12  0.45  0.41  0.45  0.38  0.24
A19  70.63  72.80  64.19  88.35   0.93  -4.02  0.45  0.48  0.30  0.35  0.22
B01   3.24   2.84   1.36  19.37   8.86  10.14  0.16  0.13  0.06  0.69  0.43
B02   4.13   3.02   0.87  20.11  19.19  18.48  0.17  0.12  0.03  0.66  0.43
B03   4.73   3.02   0.54  20.11  27.32  24.37  0.19  0.12  0.02  0.74  0.49
B04   4.87   2.92   0.44  19.70  30.85  25.63  0.17  0.10  0.02  0.72  0.48
B05  12.48  10.68   5.32  39.03  15.73  14.70  0.39  0.34  0.26  0.92  0.53
B06  14.98  11.12   3.51  39.77  28.35  26.38  0.39  0.31  0.17  0.79  0.46
B07  18.10  11.64   2.06  40.64  42.17  39.22  0.33  0.24  0.09  0.60  0.35
B08  18.73  10.85   1.08  39.32  51.11  48.24  0.24  0.17  0.04  0.41  0.24
B09  40.15  39.48  28.61  69.09   6.57   6.22  0.76  0.76  0.79  0.91  0.53
B10  42.76  39.88  25.26  69.38  13.25  12.44  0.75  0.75  0.77  0.96  0.55
B11  45.85  40.61  22.47  69.90  19.99  18.48  0.64  0.67  0.71  0.99  0.57
B12  47.22  40.64  20.68  69.92  23.76  22.06  0.55  0.62  0.68  1.04  0.60
B13  63.97  70.24  64.42  87.11  -8.37  -6.38  0.65  0.54  0.30  0.49  0.30
```

IT8.7 data reference file

4



Scan Without Profile



Scan With Profile

What You Will Need

1. Profiling application
2. IT8 or proprietary scanner target (transparency or print) matching the film or paper you want to scan
3. IT8 data reference file for the scanner target, a text file with measurements of all color patches

Procedure

1. Scan the scanner target and save it as a TIFF file between 1.5 and 5 MB in size.
2. Place the IT8 data reference file for the target on your hard disk (if Kodak, download from ftp://ftp.kodak.com/gastds/q60data).
3. Open the scanned target TIFF file and the corresponding data reference file in your profiling application and make the ICC profile.
4. Apply the scanner profile to images using the scanner application, or in Photoshop using the Image>Mode>Assign Profile command.

What You Will Need

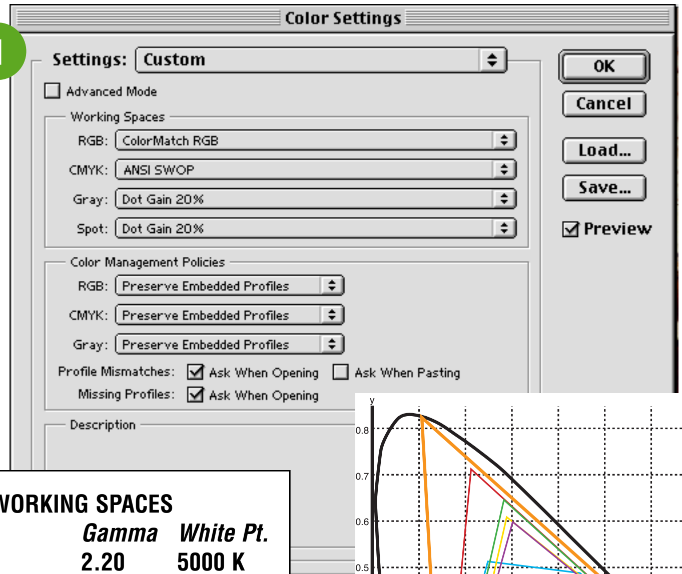
1. Emissive spectrophotometer or colorimeter capable of profiling monitors
2. Color profiling application with monitor calibration and profiling function

Procedure

1. Choose an RGB working space in Photoshop that most closely matches the gamut of your output device (see table and graph). If unsure, start with ColorMatch RGB.
2. Launch your profiling application, calibrate the emissive colorimeter/spectrophotometer as recommended by the manufactuer, and attach the instrument to the monitor.
3. Calibrate the monitor to your desired white point and gamma (e.g., 5000 K and 1.80 for ColorMatch RGB).
4. Save the monitor ICC profile and set as your system profile.
5. To compare originals and print samples to the image on your monitor, use a standard viewing booth for the most accurate color match.

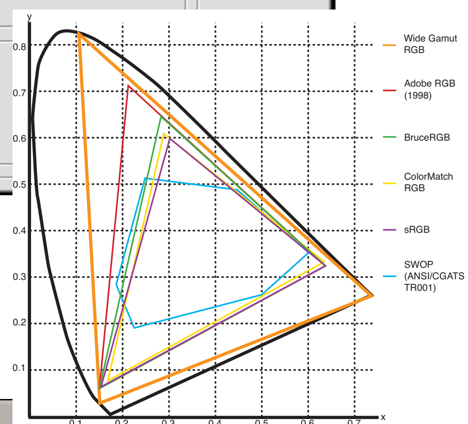
Making a Monitor Profile

1



COMMON WORKING SPACES

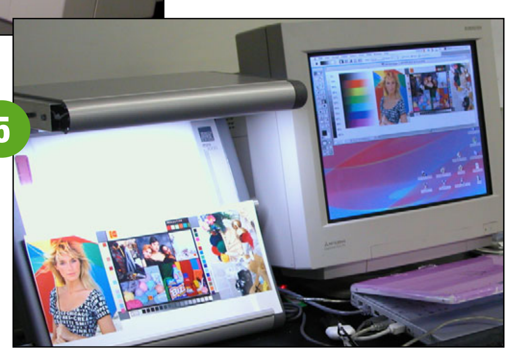
Space	*Gamma*	*White Pt.*
Adobe RGB	2.20	5000 K
Apple RGB	1.80	6500 K
ColorMatch RGB	1.80	5000 K
sRGB	2.20	6500 K



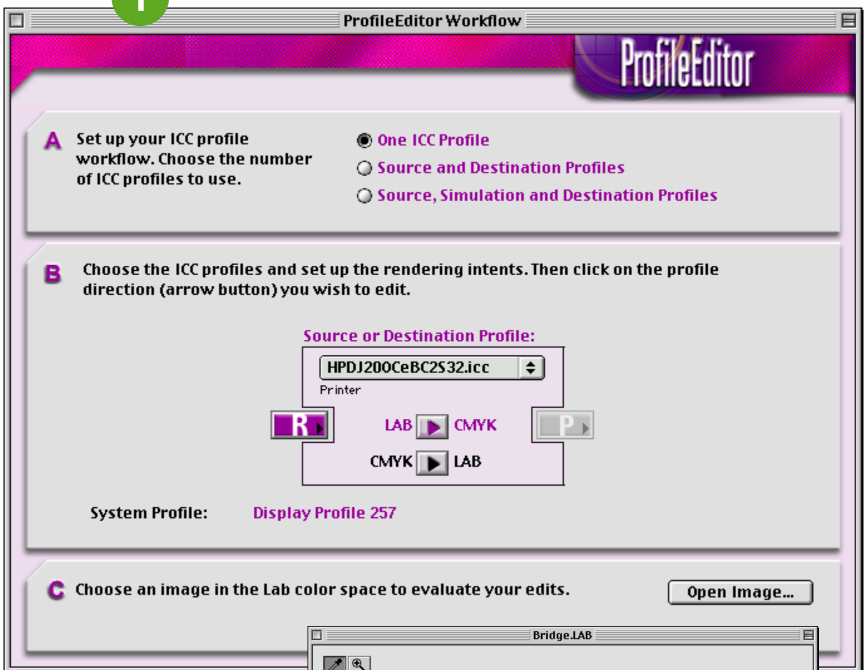
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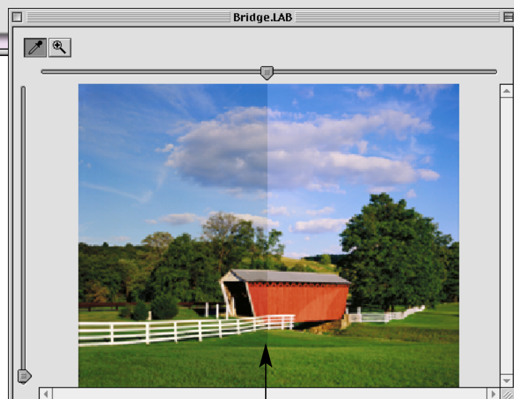


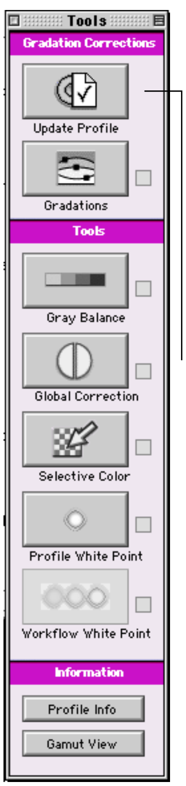
5



Profile Editing







Sample image to evaluate color edits (shown on right)

Editing Tools

Update Profile—updates the calibration in a profile

Gradations—used to change the highlight, shadow, and midtone points of CMYK curves (individually or together)

Gray Balance—edits the color balance of the profile to achieve neutral gray

Global Correction—used to edit lightness, contrast, and saturation

Selective Color—Used to edit specific colors, selected via Lightness, Chroma, and Hue

What You Will Need

1. Profile of your HP DesignJet 10/20/50ps on the medium you're using
2. Profile-editing application such as GretagMacbeth ProfileEditor or ColorBlind Edit
3. Low-resolution image in LAB mode to view your edits (To make the image, open a test photo in Photoshop, resize the image to 72 dpi, and convert to LAB mode.)

Procedure

1. In ProfileEditor, select:
   a. "A," one ICC profile.
   b. "B," open the HP DesignJet 10/20/50 profile you want to edit, select the rendering intent you plan to use (e.g., relative colorimetric for proofing), and rendering direction LAB to CMYK (this affects conversions to the output device).
   c. "C," open an image in LAB mode to view your edits. If
2. Before making any edits, save your profile as a different name.
3. Edit the profile to get a closer match to the device you want to emulate. You can edit highlights, shadows, midtones; gray balance; global color; and selective color.